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ART UNIT	PAPER NUMBER
2831	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/589,801	ANTE ET AL.	
	Examiner	Art Unit	
	FARHANA HOQUE	2831	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 August 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11-13,16,17,19,21,22,24,27,29 and 30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-13,16,17,19,21,22,24,27,29 and 30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/4/2009*.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

This Office Action is in response to the Applicant's communication filed on 8/24/2009 and preliminary amendment concurrently filed therewith. In virtue of this amendment, claims 14, 15, 18, 20, 23, 25, 26 and 28 are cancelled; and claims 11-13, 16-17, 19, 21, 22, 24, 27, 29-30 are currently presented in the instant application.

Response to Arguments

1. Applicant's arguments filed 8/24/2009 have been fully considered but they are not persuasive.

Martin discloses a method for destroying soot in an exhaust stream from an internal combustion engine which includes heating a longitudinal tube disposed within a matrix of heat- resistant media, to an initial temperature above an auto-ignition temperature of the soot to initiate oxidizing of at least a portion of the soot (see claims 23 and 52 of Martin). However, a person of ordinary skill in the art would not consider adding the heating related feature disclosed in Martin, to the Spencer device used in the flow of aircraft engine fuel, because an explosion would occur.

The examiner respectfully disagrees. Reading the claims in the broadest sense, Martin et al. discloses reducing pollutant concentration in a process gas

stream. It oxidizes soot and products of incomplete combustion in internal combustion engine exhaust emissions by use of a flameless thermal oxidizer. In Spencer, the invention relates to detecting contaminants in fluid, such as high performance aircraft. Therefore, adding the heating related feature disclosed in Martin et al. to the Spencer device would not cause an explosion due to the fact that they're both being used in combustion engines.

In Spencer, particles passing through the sensor are not collected, and counting pulses due to the passing particles is not collecting particles either. Merely juxtaposing features of Spencer's device to positively recited feature of claim 11 in the above-reproduced response to Applicants' previous arguments does not amount to legally sufficient evidence supporting a prima facie case of anticipation or obviousness. In fact, in case of soot particles in gas as in the current application, Spencer's counting method cannot be applied because the number of particle is too large to be practically considered counting them. Therefore, a rather collective effect in changing a characteristic variable is determined in the claimed method, the particles need than to be collected in order to measure their concentration.

The examiner respectfully disagrees. Reading the claims in the broadest sense, the particles passing through the sensor device in Spencer are being collected and counted due the fact that the pulses resulting from particle flow

through the sensor are amplified and counted or averaged to measure total contamination. In order for that to happen the particles will thus need to be collected to determine a total contamination in the gas stream.

Additionally, Spencer's device does not need to heat the sensor above the ignition temperature of the particles, because no particle load occurs as the impurities in the fuel are not collected but merely pass through. Spencer's device does not measure soot particles, but far larger particles of rust, sand or dirt (see col. 1, lines 16-23). Even if, only for the sake of the argument, one would consider that Spencer's sensor would accidentally collect some of the particles, the particles cannot be burned in a fuel flow by being heated above the ignition temperature because the fuel would likely also ignite.

The examiner respectfully disagrees. Reading the claims in the broadest sense, the particles are being collected and counted in order to measure a total contamination. Particles of different sizes are being measured as stated in Spencer, col. 1, lines 24-39. Further by heating above the ignition temperature in Spencer would not ignite the fuel as stated in response 1 above due to the fact that in both Spencer and Martin et al. internal combustion engines are being used.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 11-13, 16, 21, 22, 24, 27, 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spencer, (U.S. Patent No. 3,231,815) in view of Martin et al. (U.S. Patent No. 6,003,305).

With respect to claim 11, Spencer discloses, a method for monitoring particle concentration in a gas stream, comprising: (1) collecting particles by a sensor (see Fig. 2) in the gas stream (col. 2, lines 12-16), the sensor (see Fig. 2) integrated as a capacitive element (col. 6, lines 65-69) into an electromagnetic resonant circuit (see Fig. 1); exciting the resonant circuit with an alternating voltage [64] (see Fig. 3 *termed as an alternating voltage amplifier; also col. 3, lines 24-29); (2) determining a reference value of a characteristic variable of the resonant circuit, the characteristic variable varying as a result of particle load of the sensor (col. 3, lines 45-49), the reference value being determined when the sensor is not loaded (see col. 3, lines 45-49), where the characteristic variable is one of a resonant frequency of the resonant circuit and a voltage across the sensor when the resonant circuit is excited by the alternating voltage [64] (see

Fig. 3 *termed as an alternating voltage amplifier) having a fixed frequency and a fixed amplitude (see col. 6, line 71 – col. 7, line 2); and (3) determining a change in the characteristic variable brought about by the particle load compared to the reference value (see col. 5, lines 13-21).

Spencer does not disclose heating the sensor to a temperature above the ignition temperature of the particles and sufficient to remove a particle load.

Martin et al. discloses, heating the sensor to a temperature above the ignition temperature of the particles and sufficient to remove a particle load (col. 26, lines 11-14).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include in the method disclosed by Spencer, a step to heating the sensor to a temperature above the ignition temperature of the particles and sufficient to remove a particle load as taught by Martin et al. to increase destruction and removal efficiency of soot (col. 5, line 61) so as to predictably ensure more accurate readings.

With respect to claim 12, the combination of Spencer and Martin et al. discloses, the method as recited in claim 11, wherein a frequency of the alternating voltage [64] (see Fig. 3 *termed as an alternating voltage amplifier) exciting the resonant circuit is tuned to determine the resonant frequency of the resonant circuit, as the characteristic variable (see Fig. 4, also col. 3, lines 24-32 and lines 49-56).

With respect to claim 13, the combination of Spencer and Martin et al. discloses the method as recited in claim 12, further comprising heating the sensor, during the determining of the reference value of the characteristic variable, to a temperature below an ignition temperature of the particles and sufficient to remove impurities adhering to the sensor (see Martin et al. col. 3, lines 25-35; also col. 21, lines 38-40).

With respect to claim 16, Spencer discloses, a device, excited with alternating voltage [64] (see Fig. 3 *termed as an alternating voltage amplifier), for monitoring particle concentration in a gas stream, comprising:

an electromagnetic resonant circuit (see Fig. 1) excited with the alternating voltage [64] (see Fig. 3 *termed as an alternating voltage amplifier); a sensor (see Fig. 2) in the gas stream, integrated as a capacitive element into the electromagnetic resonant circuit (col. 6, lines 65-69), collecting particles, having a nonconductive base body made of porous material and two electrodes spaced apart from one another [8, 24] (see Fig. 1, *the space between the two electrodes is the nonconductive base body made of air, the air being a porous material) and embedded in the nonconductive base body [8, 24] (see Fig. 1); and

a characteristic variable determiner determining change in a characteristic variable of the electromagnetic resonant circuit (col. 5, lines 13-21), the characteristic variable varying as a result of particle load of said sensor, from a

reference value determined when said sensor [see Fig. 2] is not loaded due to having been heated above an ignition temperature of the particles, where the characteristic variable is one of a resonant frequency of the resonant circuit and a voltage across the sensor when the resonant circuit is excited by the alternating voltage [64] (see Fig. 3 *termed as an alternating voltage amplifier) having a fixed frequency and fixed amplitude (col. 6, line 71 – col. 7, line 2).

Spencer does not disclose a heating device heating said sensor above the ignition temperature of the particles prior to determining of the reference value of the characteristic variable.

Martin et al. discloses a heating device heating said sensor above the ignition temperature of the particles prior to determining of the reference value of the characteristic variable (col. 26, lines 11-14).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include in the method disclosed by Spencer, a step to heating the sensor above the ignition temperature of the particles prior to determining the reference value of the characteristic variable as taught by Martin et al. to increase destruction and removal efficiency of soot (col. 5, line 61) so as to predictably ensure more accurate readings.

With respect to claim 21, the combination of Spencer and Martin et al., disclose all the limitations according to claim 16, wherein the base body includes

a catalytically active layer (see Martin et al. col. 9, lines 22-37; also col. 3, lines 25-30).

With respect to claim 22, the combination of Spencer and Martin et al., disclose all the limitations according to claim 21, wherein the particles are soot particles in an exhaust gas stream of an internal combustion engine (see Martin et al. col. 1, lines 6-10).

With respect to claim 24, the combination of Spencer and Martin et al. discloses the device as recited in claim 16, wherein the electrodes [8, 24] (see Spencer Fig. 1) are arranged on a side of the nonconductive base body inaccessible to the particles (see Spencer Fig. 1).

With respect to claim 27, the combination of Spencer and Martin et al. discloses the device as recited in claim 16, wherein the particles are soot particles in an exhaust gas stream of an internal combustion engine (see Spencer col. 1, lines 9-15).

With respect to claim 29, the combination of Spencer and Martin et al. discloses the device as recited in claim 11, wherein the particles are soot particles in an exhaust gas stream of an internal combustion engine (see Spencer col. 1, lines 9-15).

With respect to claim 30, Spencer discloses an apparatus for monitoring soot particle concentration in a gas stream, comprising:

an electromagnetic resonant circuit excited with an alternating voltage of variable frequency; a sensor (see Fig. 2) in the gas stream, integrated as a capacitive element (col. 6, lines 65-69) into the electromagnetic resonant circuit (see Fig. 1), collecting soot particles between electrodes [8,24] (see Fig. 1) of the capacitive element (col. 6, lines 65-69); and a particle concentration estimator [86] (see Fig. 3; also col. 5, lines 52-55) estimating the soot particle concentration in the gas stream (col. 2, lines 12-16) based on a change in a resonance frequency of the electromagnetic resonant circuit (see Fig. 1) due to the collected sooth particles in the sensor (see Fig. 2).

Spencer does not disclose a heating device heating said sensor above an ignition temperature of the particles to remove the collected soot particles from the sensor.

Martin et al. discloses, heating the sensor to a temperature above the ignition temperature of the particles to remove the collected soot particles from the sensor (col. 26, lines 11-14).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include in the method disclosed by Spencer, a step to heating said sensor above an ignition temperature of the particles to remove the collected soot particles from the sensor as taught by Martin et al. to increase

destruction and removal efficiency of soot (col. 5, line 61) so as to predictably ensure more accurate readings.

4. Claims 17 and 19 are rejected under 35 U.S.C 103(a) as being unpatentable over Spencer, (U.S. Patent No. 3,231,815) in view of Ziegler (U.S. Patent No. 5,447,076).

With respect to claim 17, Spencer discloses all the limitations according to claim 16.

Spencer does not disclose the device, wherein the nonconductive base body is composed of ceramic

Ziegler discloses wherein the nonconductive base body is composed of ceramic (see Ziegler col. 5, lines 35-36).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of Spencer to include a nonconductive base body made of ceramic as taught by Ziegler to predictably provide a region which supports magnetic flux from magnetic fields established by current through conductor.

With respect to claim 19, the combination of Spencer and Kiegler disclose all the limitations according to claim 17, wherein the electrodes are arranged on a

side of the nonconductive base body (see Kiegler col. 5, lines 35-36) inaccessible to the particles [8, 24] (see Spencer Fig. 1).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to FARHANA HOQUE whose telephone number is (571)270-7543. The examiner can normally be reached on Monday - Friday 8:30-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on (571) 272-2245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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